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**IN THE CLAIMS:**

**Please amend the claims, as follows:**

1. (Amended) An arrayed waveguide grating, comprising:
  - a substrate;
  - a first channel waveguide disposed on the substrate;
  - a parabolized channel waveguide array disposed on said substrate and constituted such that each length of parabolized waveguides in the parabolized channel waveguide array is sequentially longer with a predetermined difference between the lengths of the waveguides;
  - a first slab waveguide disposed on said substrate and connecting said first channel waveguide with said parabolized channel waveguide array;
  - a second slab waveguide disposed on said substrate and connecting an end of said channel waveguide array on the side wherein said first slab waveguide has not been connected thereto with an end thereof, and
  - a second channel waveguide disposed on said substrate and connected to the other end of said second slab waveguide waveguide, wherein a waveguide part in the connected area has a parabolic configuration.

2-3. (Canceled)

4. (Previously presented) An arrayed waveguide grating as claimed in claim 1, wherein said waveguide part parabolic configuration is individually adjusted in response to respective wavelengths of multiplexed optical signals input to said first channel waveguide.

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5-9. (Canceled)

10. (Previously presented) The arrayed waveguide grating of claim 1, wherein said waveguide part is formed as a parabolic configuration, wherein said parabolic configuration can be defined by a quadratic function.

11. (Previously presented) The arrayed waveguide grating of claim 10, wherein a width  $W(z)$  of the waveguide part is equal to

$$\{2\alpha\lambda/n_{eff}(L-Z) + Wc^2\}^{1/2}$$

wherein  $\alpha$  is a parabolic coefficient,  $\lambda$  is an optical wavelength of an optical transmission signal,  $n_{eff}$  is an effective index,  $Wc$  is a core width of the second channel optical waveguide, and  $Z$  is the width of the parabolic waveguide part at length  $L$ .

12. (Previously presented) The arrayed waveguide grating of claim 1, wherein the waveguide part has a core width measuring from approximately one to five times a width of a Gaussian distribution produced in a boundary between the second slab waveguide and the second channel waveguide.

13. (Previously amended) The arrayed waveguide grating of claim 1, wherein said parabolic waveguide part is adjusted to compensate for varying optical transmission widths and insertion loss of said optical transmissions.

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14. (Currently amended) The arrayed waveguide grating of claim 1, wherein said first sector slab waveguide comprises a second parabolic waveguide part.

15. (Currently amended) The arrayed waveguide of claim 11, wherein the core width at the perimeter of said parabolic waveguide part is formed ~~in common with~~ to have varying widths as appropriate for varying wavelengths of multiplexed optical signals input to said first channel waveguide.

16. (Currently amended) A method for fabricating a device for multiplexing-demultiplexing an optical transmission, comprising:

forming an arrayed waveguide grating on a substrate;

forming a first channel waveguide on the ~~a~~ substrate, said first channel waveguide serving as an input signal waveguide for a multiplex operation in a multiplex/demultiplex process;

forming a second channel waveguide on said substrate, said second channel waveguide serving as an output signal waveguide for said multiplex/demultiplex process;

forming a parabolized channel waveguide array on the substrate, wherein each length of the waveguides in the array is sequentially longer;

connecting, with a first slab waveguide, said first channel waveguide to a first end of said channel waveguide array; and

connecting, with a second slab waveguide, a second end of said channel waveguide array to said second channel waveguide, forming waveguide, wherein an end of each waveguide comprising said second channel waveguide that connects to said second slab

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waveguide includes a parabolic waveguide part connecting to an end of the second channel waveguide opposite to an end connected to the second slab waveguide.

17. (Currently amended) The method of claim 16, wherein said forming a parabolized channel waveguide array forms said comprises an array with a predetermined difference in the lengths of the waveguides.

18. (Currently amended) The arrayed waveguide grating method of claim 16, wherein said forming a parabolic waveguide part forms an adjustable parabolic waveguide part is formed as an element preadjusted to a specific signal wavelength.

19. (Currently amended) The method of claim 16, wherein said forming said parabolic waveguide part comprises forming a parabolic width  $W(z)$  that equals

$$\{2\alpha\lambda/n_{\text{eff}}(L-Z) + W_c^2\}^{1/2}$$

wherein  $\alpha$  is the parabolic coefficient,  $\lambda$  is the optical wavelength of the optical transmission,  $n_{\text{eff}}$  is an effective index,  $W_c$  is a width of an outputting channel optical waveguide, and  $Z$  is the parabolic width at length  $L$ .

20. (Previously presented) The method of claim 19, wherein the forming the core opening width comprises forming widths from approximately one times to five times a width of a Gaussian distribution produced in a boundary between the second slab waveguide and the second channel waveguide.

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21. (Previously presented) The method of claim 16, further comprising:  
adjusting the waveguide part to compensate for varying optical transmission widths  
and insertion loss of the optical transmissions.

22. (Currently amended) The method of claim 16, wherein the forming first channel  
waveguide is formed so that a part connecting to the first slab waveguide comprises forming is  
shaped to form a second parabolic waveguide part on said substrate.

23. (Currently amended) The method of claim 16, wherein the forming the a core opening  
width of each waveguide comprising said second channel waveguide is comprises forming the  
core width in common with varying wavelengths of multiplexed optical signals input to said  
first channel waveguide and a width of an opening of said parabolic waveguide part is preset in  
accordance to a specific wavelength.

24. (Currently amended) An arrayed waveguide grating, comprising:  
a substrate;  
a first channel waveguide disposed on the substrate;  
a parabolized channel waveguide array, disposed on said substrate, comprising a  
plurality of parabolized waveguides of differing lengths, each waveguide in said plurality of  
waveguides formed in a routing that is shaped to form a parabola;  
a first slab waveguide disposed on said substrate and connecting said first channel  
waveguide with said parabolized channel waveguide array;

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a second slab waveguide disposed on said substrate and connecting an end of said channel waveguide array on the side wherein said first slab waveguide has not been connected thereto with an end thereof.

25. (Previously presented) The arrayed waveguide grating of claim 24, wherein said parabolized channel waveguide array is formed such that each length of said parabolized waveguides is sequentially longer.

26. (Previously presented) The arrayed waveguide grating of claim 24, further comprising:  
a waveguide part; and  
a second channel waveguide disposed on said substrate and connected to the other end of said second slab waveguide,  
wherein said waveguide part in the connected area has a parabolic configuration.

27. (Currently amended) The arrayed waveguide grating of claim 26, wherein said parabolic configuration of said waveguide part is adjustable preadjusted according to a wavelength.

28. (Currently amended) The arrayed waveguide grating of claim 26, wherein said waveguide part parabolic configuration is individually adjusted in response to preadjusted according to respective wavelengths of multiplexed optical signals input to said first channel waveguide.